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Research Article

A COMPARATIVE STUDY ON GROWTH AND PRODUCTION TRAITS OF IMPROVED POULTRY BREEDS UNDER BACKYARD MANAGEMENT PRACTICES IN SOUTH 24 PARGANAS DISTRICT OF WEST BENGAL, INDIA

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ABSTRACT: Four chicken genotypes (*Rhode Island Red, Vanaraja, Haringhata Black and Divyayan Red*) were evaluated for their suitability under backyard farming in South 24 Parganas district of West Bengal, India. The experiment was carried out in a randomized design with seven replications. Body weight gain and adult body weight (2008.3 gm) were significantly (P<0.05) higher in *Divyayan Red*. This breed was also proved to be superior to other three breeds in terms of age at sexual maturity (168 days), egg production (155 numbers) and egg weight (55.5 gm). It can be concluded that *Divyayan Red* breed could be considered for poultry breeding programs in South 24 Parganas district of West Bengal, India.

Key words: Backyard Poultry, Egg Production, Growth Performance, South 24 Parganas.

INTRODUCTION

South 24 Parganas district is the largest district of West Bengal and conglomerate of different development blocks separated by tidal water ways. Majority of the people of this district are economically backward (Census 2011) and have limited livelihood options due to salinity of soil, population pressure, over-dependence on natural resources, frequent cyclones and difficult communications. At the outset of fragile ecosystem and harsh livelihood conditions, backyard poultry farming may be an attractive alternate livelihood option for the local farmers and if good management practice adopted this venture could be very promising (FAO 2003).

Due to interventions of many Govt./Non-Govt. institutes for last couple of decades, local farmers of the district adopted *RIR* birds as an better alternate to *Deshi* (Non-Descript) poultry birds. However, production potential of RIR breed seems to be capped in low input farming system (Dumrya 2015). In this scenario, sincere attempts have been made by KVK to popularise different new generation poultry birds like *Vanaraja* (Developed by Project Directorate, Hyderabad), *Haringhata Black* (Native breed to West Bengal) and *Divyayan Red* (Developed by KVK, Ranchi) that might be more suitable for backyard management in the district. Present study was aimed to compare the growth performance and production traits of four poultry breeds under backyard management practices in South 24 Parganas district of West Bengal.

MATERIALS AND METHODS

Study Area

The present study was conducted in South 24 Parganas district of West Bengal, India during September, 2014 to March, 2016. In this district, three development blocks (Sonarpur, Baruipur and Basanti) were randomly chosen for recording of poultry body weights and production traits. From each block, two villages were selected purposively.

Sampling of Birds

Straight run poultry birds were obtained from Government/KVK hatchery, reared under KVK farm up to age of 2 weeks and then only female birds were distributed to farmers for 'On Farm Trial (OFT)' purposes under KVK. From six villages total seven beneficiaries, who had prior experience on poultry farming, were

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Fig. 1. Divyayan Red poultry flock in the backyard.

chosen. Each beneficiary was given ten numbers of each breed (*Rhode Island Red, Vanaraja, Haringhata Black and Divyayan Red*). Body weight and production data of 280 chickens (70 chickens from each four breed) were recorded from time to time from villages. All the birds were fed 'starter' mash (Epic Feed) up to the age of 2 weeks. In the backyard management, all the birds were kept under scavenging feeding system with supplementary feeds (Mixture of 45% broken maize, 25% broken rice and 30% sunflower cake) at the rate of 70 g per adult bird per day. Routine deworming and vaccination schedule were followed in flocks as per standard practice. Mortality rate of each breed was within 10% limit.

Statistical Analysis

Data were statistically analysed in SPSS (version 16.0) computer program using one-way ANOVA for more than 2 groups of observations. Multiple comparisons were also made by Duncan's Multiple Range Tests (Duncan 1955).

RESULTS AND DISCUSSION

Growth Performances

Comparative data on body weight of different age groups are presented in Table 1. It clearly indicated that *Divyayan Red* poultry breed (Fig.1) was the fastest growing breed and it achieved significantly ($P<0.05$) higher body weight (2008.3 g) at maturity followed by *Vanaraja* (1749.7 g), *Rhode Island Red (RIR)* (1372.9 g) and *Haringhata Black* (1159.8 g) breeds. Hens from Haringhata Black breed showed slowest growth that is common in indigenous lines. Hassen *et al*. (2006) and Alam *et al*. (2014) reported similar slow growth pattern of adult non-descript local hens in Ethiopia and Bangladesh respectively. Reports (Thakur *et al*. 2006) suggested that famous *Kadaknath* breed reared under tribal villages in central India exhibited similar growth pattern like *Haringhata Black* breed. Adult body weight of RIR breed was also in agreement with Hassen *et al*. (2006). In the present study, adult body weight of *Vanaraja* breed was recorded lower as compared to earlier reports (Pathak and Nath 2013) that stated its average adult body weight was 2300 gm. This variation might be attributed to different management practices adopted and local climatic variations.

Production Performances

Age at sexual maturity, egg production and egg weight of different poultry breeds were presented in Table 2. No significant ($P<0.05$) difference was observed among the breeds except *Vanaraja* that took maximum time for sexual maturity (191.6 days). *Divyayan Red* was the fastest (168 days) to reach sexual maturity. Age of sexual

Table 1. Growth Performances (Mean ± SE) of Different Poultry Breeds.

Age	Body Weight (g) of Poultry Breeds			
	Rhode Island Red	**Haringhata Black**	**Vanaraja**	**Divyayan Red**
At Hatch	32.0±0.57^{c}	30.9±0.64^{c}	39.3±1.17^{b}	50.3±1.08^{a}
1 week	49.4±1.60^{b}	48.3±0.95^{b}	94.3±1.40^{a}	91.2±1.45^{a}
2 week	68.200±3.36^{c}	68.3±1.01^{c}	143.5±1.27^{b}	165.90±2.17^{a}
4 week	170.700±8.52^{b}	174.2±8.30^{b}	260.6±2.05^{a}	274.800±4.12^{a}
8 week	327.3±8.37^{d}	295.3±13.96^{c}	365.600±8.99^{b}	659.9±4.15^{a}
12 week	730.5±12.7^{c}	478.5±19.46^{b}	876±15.07^{a}	880.500±12.12^{a}
16week	1010.5±21.81^{d}	695.300±14.99^{c}	1145.5±28.72^{b}	1248.0±31.68^{a}
20 week	1151.5±24.17^{d}	841±17.47^{c}	1376.5±32.58^{b}	1666.8±28.84^{a}
At the Onset of Laying	1372.9±50.21^{d}	1159.8±59.90^{c}	1749.7±62.47^{b}	2008.300±34.29^{a}

*Means bearing at least one common superscript in each row do not differ significantly ($p<0.05$).

Table 2. Production Performances (Mean ± SE) of Different Poultry Breeds.

Quantitative Traits	Poultry Breeds			
	RIR	Vanaraja	Haringhata Black	Divyayan Red
Age at Sexual Maturity (Days)	175.4±2.58[b]	191.6±2.23[a]	171±3.24[b]	168±1.93[b]
Egg Production upto 72 weeks (Nos.)	137.8±1.45[d]	115±1.11[c]	124±2.14[b]	155±2.54[a]
Egg Weight at 40 weeks (g)	54.6±0.52[a]	54.2±0.41[a]	47.4±0.73[b]	55.5±0.3[a]

*Means bearing at least one common superscript in each row do not differ significantly ($p<0.05$).

maturity of *Haringhata Black (*171 days) was found to be similar to that of local non-descript hens of Bangladesh as reported by Alam *et al*. (2014).

Egg production (up to 72 weeks) varied significantly ($P<0.05$) across the breeds. Each genotype showed distinct egg production performance. All the four breeds produced eggs in one or two clutches. Divyayan Red produced highest numbers of eggs (155) followed by *RIR* (137.8), *Haringhata Black* (124) and *Vanaraja* (115). Egg production performance of RIR was in agreement with earlier workers (Hassen *et al*. 2006, Taj *et al*. 2014). This trait is important from farmers' financial point of view. It is clear from the data that *Divyayan Red* is most suitable for rearing even in low input farming.

There were no significant ($P<0.05$) differences in egg weight (at 40 week) except for *Haringhata Black* that produced eggs with least weight (47.4 g). Maximum egg weight was found in case of *Divyayan Red* (55.5) followed by *RIR* (54.6) and *Vanaraja* (54.2). These results were in agreement with Pathak and Nath (2013).

It may be concluded that if proper management and care provided, *Divyayan Red* breed could serve as an outstanding dual purpose poultry breed in backyard system of rearing in South 24 Parganas district owing to its ability for faster growth, high body weight, faster sexual maturity, better egg production and egg weight. Government and Non- Government organisations must initiate large scale propagation of this unique breed in backyard farming system for achieving better livelihood in the concerned region.

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